IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application No. 09/965,518	) **For:**	**Turbo Decoding Method and Apparatus for Wireless Communications**
Sindhushayana et al.	)	
Examiner: Juan A. Torres	)	
Filed: September 25, 2001	) **Group No.**	**2611**

REPLY BRIEF TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

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This Reply Brief is submitted in response to the Examiner's Answer mailed on November 9, 2006. Because the Brief is filed within two months of the mailing date of the Examiner's Answer, it is timely. 37 C.F.R. §41.41(a)(1). No fees are needed to file this Reply Brief. If the undersigned attorney is mistaken regarding the fees, authorization is hereby granted to charge to Deposit Account No. 17-0026 all fees necessary to file this Reply Brief.

Applicants-Appellants rely on the Appeal Brief dated July 31, 2006, for exposition of the grounds for reversal of the rejections, and take this opportunity to respond to a number of assertions made in the Examiner's Answer. Appellants intend the arguments in this Reply Brief to supplement the arguments made in the Appeal Brief, rather than to replace those arguments.

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ARGUMENT

A. Prior Art

In the Final Office Action from which this Appeal is taken, all claims were rejected as either being anticipated by the admitted prior art in Figure 5 of the present application, or as being unpatentable over the admitted prior art in view of Xu *et al.*, U.S. Patent Application Publication Number 2001/0052104 ("Xu"). No other art was used for rejecting the claims. Nevertheless, the Examiner's Answer lists Hagenauer *et al.*, U.S. Patent Number 5,761,248 ("Hagenauer") under the heading of Evidence Relied Upon (page 4 of the Examiner's Answer). The Examiner's Answer then asserts (also on page 4) that "US 5761248 A discloses the admitted prior art in figure 1 column 5 line 24 to column 6 line 61."

Hagenauer was not used to reject any of the pending claims in the Final Office Action. The rejections in the Examiner's Answer also apparently do not mention Hagenauer. Furthermore, the Examiner's Answer does not prominently identify any new grounds of rejection, as must be done in accordance with MPEP § 1207.03(I) when such grounds are present in an Examiner's Answer. We respectfully take issue with the attempt in the Examiner's Answer to expand the admitted prior art of Figure 5 through the use of Hagenauer. Figure 5 of the present application speaks for itself.

B. Construction of Claim Terms

1. Claim Terms May Not Be Construed in Derogation of the Specification

Because the Examiner's Answer construes a number of claim terms in a manner inconsistent with the use if these terms in the specification of the present application, we first briefly discuss the applicable standard for construing claim terms, and in particular the standard governing the use of intrinsic versus extrinsic sources in claim construction.

The controlling precedent regarding the use of intrinsic and extrinsic sources for determining the scope of the claims is set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 U.S.P.Q.2D 1321 (Fed. Cir. 2005) (*en banc*). In this *en banc* decision, the Court of Appeals for the Federal Circuit underscored that one of ordinary skill in the art reads claims not in the vacuum, but in the context of the intrinsic record: "Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which

the disputed term appears, but in the context of the entire patent, including the specification." *Phillips v. AWH Corp.*, 415 F.3d at 1313.

The Court of Appeals for the Federal Circuit left little doubt regarding the relative roles of the specification and extrinsic sources such as dictionaries in the process of claim construction, noting that the specification "is always highly relevant to the claim construction analysis," and "[u]sually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Phillips v. AWH Corp.*, 415 F.3d at 1315 (*quoting Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). The Court of Appeals for the Federal Circuit also urged that this principle was well established in its own precedents, precedents of its predecessors (the Court of Customs and Patent Appeals and the Court of Claims), and Supreme Court precedents:

> This court and its predecessors have long emphasized the importance of the specification in claim construction. In *Autogiro Co. of America v. United States*, 181 Ct. Cl. 55, 384 F.2d 391, 397-98 (Ct. Cl. 1967), the Court of Claims characterized the specification as "a concordance for the claims," based on the statutory requirement that the specification "describe the manner and process of making and using" the patented invention. The Court of Customs and Patent Appeals made a similar point. See *In re Fout*, 675 F.2d 297, 300 (CCPA 1982) ("Claims must always be read in light of the specification. Here, the specification makes plain what the appellants did and did not invent . . . .").
>
> Shortly after the creation of this court, Judge Rich wrote that "the descriptive part of the specification aids in ascertaining the scope and meaning of the claims inasmuch as the words of the claims must be based on the description. The specification is, thus, the primary basis for construing the claims." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985). On numerous occasions since then, we have reaffirmed that point, stating that "the best source for understanding a technical term is the specification from which it arose, informed, as needed, by the prosecution history." *Multiform Dessicants*, 133 F.3d at 1478; *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1360 (Fed. Cir. 2004) ("In most cases, the best source for discerning the proper context of claim terms is the patent specification wherein the patent applicant describes the invention."); *see also, e.g., Kinik Co. v. Int'l Trade Comm'n*, 362 F.3d 1359, 1365 (Fed. Cir. 2004) ("The words of patent claims have the meaning and scope with which they are used in the specification and the prosecution history."); *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1315 (Fed. Cir. 2003) ("The best indicator of claim meaning is its usage in context as understood by one of skill in the art at the time of invention.").
>
> That principle has a long pedigree in Supreme Court decisions as well. *See Hogg v. Emerson*, 47 U.S. (6 How.) 437, 482, 12 L. Ed. 505 (1848) (the specification is a "component part of the patent" and "is as much to be considered with the [letters patent] in construing them, as any paper referred to in a deed or

> other contract"); *Bates v. Coe*, 98 U.S. 31, 38, 25 L. Ed. 68, 1879 Dec. Comm'r Pat. 365 (1878) ("in case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and meaning of the language employed in the claims"); *White v. Dunbar*, 119 U.S. 47, 51, 30 L. Ed. 303, 7 S. Ct. 72, 1886 Dec. Comm'r Pat. 494 (1886) (specification is appropriately resorted to "for the purpose of better understanding the meaning of the claim"); *Schriber-Schroth Co. v. Cleveland Trust Co.*, 311 U.S. 211, 217, 85 L. Ed. 132, 61 S. Ct. 235, 1941 Dec. Comm'r Pat. 802 (1940) ("The claims of a patent are always to be read or interpreted in light of its specifications."); *United States v. Adams*, 383 U.S. 39, 49, 15 L. Ed. 2d 572, 86 S. Ct. 708, 174 Ct. Cl. 1293 (1966) ("It is fundamental that claims are to be construed in the light of the specifications and both are to be read with a view to ascertaining the invention.").

Phillips v. AWH Corp., 415 F.3d at 1315-1316.

The Court of Appeals for the Federal Circuit then went on to explain the proper claim construction process during patent prosecution:

> The pertinence of the specification to claim construction is reinforced by the manner in which a patent is issued. The Patent and Trademark Office ("PTO") determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction "in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). Indeed, the rules of the PTO require that application claims must "conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description." 37 C.F.R. § 1.75(d)(1).

Phillips v. AWH Corp., 415 F.3d at 1316-1317. Thus, it is well established that claims must be given their broadest reasonable construction not in the vacuum, as the Examiner's Answer apparently attempts to do here, but "in light of the specification as it would be interpreted by one of ordinary skill in the art."

In *Phillips*, the Court of Appeals for the Federal Circuit acknowledged that extrinsic evidence such as dictionaries "can be useful in claim construction." *Phillips v. AWH Corp.*, 415 F.3d at 1318. But the Court also pointedly elaborated a number of reasons why extrinsic evidence is less reliable than intrinsic evidence. *Phillips v. AWH Corp.*, 415 F.3d at 1318. In particular, the Court noted that "extrinsic evidence by definition is not part of the patent and does not have the specification's virtue of being created at the time of patent prosecution for the purpose of explaining the patent's scope and meaning." *Id.* The Court also emphasized that

"undue reliance on extrinsic evidence poses the risk that it will be used to change the meaning of claims in derogation of the 'indisputable public records consisting of the claims, the specification and the prosecution history,' thereby undermining the public notice function of patents." *Phillips v. AWH Corp.*, 415 F.3d at 1319 (*quoting Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1578 (Fed. Cir. 1995)).

Specification is the primary source for determining meaning of the claim terms. Dictionaries and other external sources should not be used "in derogation" of this source.

We would also like to draw the honorable Board's attention to post- *Phillips v. AWH Corp.* pronouncements of the Court of Appeals for the Federal Circuit that speak directly on the issue of construing a claim term in the presence of multiple dictionary definitions. In one opinion, the Court explained that

> [u]nder *Phillips*, the rule that a court will give a claim term the full range of its ordinary meaning, . . . does not mean that the term will presumptively receive its broadest dictionary definition or the aggregate of multiple dictionary definitions, … . Rather, in those circumstances where reference to dictionaries is appropriate, the task is to scrutinize the intrinsic evidence in order to determine the most appropriate definition.

Free Motion Fitness, 423 F.3d at 1348-49 (internal quote marks and citations omitted). The dissent agreed with this statement of the law. *Free Motion Fitness*, 423 F.3d at 1354. See also *Nystrom v. TREX Co. Inc.*, 424 F.3d 1136 (Fed. Cir. 2005) (It is improper to read a term to encompass a broader definition simply because it may be found in an extrinsic source.)

It is well established that an applicant can be his or her own lexicographer and explicitly define terms. MPEP § 2173.05(a). "When the specification states the meaning that a term in the claim is intended to have, the claim is examined using that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art." *Id.* (*citing In re Zletz*, 893 F.2d 319 (Fed. Cir. 1989)). But the definition or redefinition of a claim term in the specification need not be explicit; terms may be defined or redefined "by implication." *Bell Atl. Network Servs., Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258, 1268, 59 U.S.P.Q.2d 1865, 1870 (Fed. Cir. 2001) ("[A] claim term may be clearly redefined without an explicit statement of redefinition."); *Scimed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1344, 58 U.S.P.Q.2d 1059, 1065 (Fed. Cir. 2001). "In other words, the specification may define claim terms 'by implication' such that the meaning may be 'found in or ascertained by a reading of the patent documents.'" *Bell Atl. Network Servs.*, 262 F.3d at 1268 (*quoting*

Vitronics, 90 F.3d at 1582 n.6, 39 U.S.P.Q.2d at 1577, 1578 n.6).

Here, a number of claim terms are in issue, and, in case of each term, the Examiner's Answer uses meaning in derogation of the meaning prescribed to the term by the specification.

2. Meanings of *Essentially Concurrently* and *Different Instances of Time*

The meaning of "essentially concurrently" is defined in the specification of the present application:

> In accordance with an embodiment, all the computation nodes 704 and 706 may be triggered essentially concurrently. As such, in one step all the computational nodes are once updated. Each time all the computational nodes are updated, the decoding process may have completed on [sic, one] decoding iteration. The concurrent trigger of the computational nodes 704 and 706 may be repeated to achieve one or more iterations of the decoding process.

Specification, at page 22, lines 6-12 (last four sentences of paragraph [00048]) (emphasis added). Thus, "essentially concurrent" triggering of all computational nodes means that the nodes are updated in one step to complete one decoding iteration; the results of updating of some nodes are not used in updating other nodes during the same iteration in order to perform the updating in one step. As we argued in the Appeal Brief, Figure 5 and its description in the specification do not disclose this limitation.

In response to our arguments, the Examiner's Answer (page 19) quotes various dictionary meanings of the word *concurrently*. The Examiner's Answer then purposely disregards the meaning of *concurrently* given in the quoted dictionary that is most closely aligned with the definition in the specification:

> As defined by the American Heritage College Dictionary, used in the USPTO concurrently means "1. Happening at the same time as something else. 2. Operating or acting in conjunction with another. 3. Meeting or tending to meet the same point, convergent. 4. Being in accordance, harmonious". The definition of happening at the same time have to be disregarded, because it cannot happen at "different times" (see previous paragraph) and at the same time simultaneously; so all other acceptations are clearly indicated . . . .

Examiner's Answer, page 19. It thus appears not to be disputed that the rejections are based on the construction of *essentially concurrently* that is based on the aggregate of multiple dictionary definitions of *concurrently* with the exception of the very definition of *concurrently* in the specification of the present application. The reason given for such construction appears to be that in the Examiner's opinion construing *concurrently* as dictated by the specification would

makes no sense.

Initially, note that claims are construed as written, even if the result is a nonsensical construction of the claim as a whole. *See Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374, 69 U.S.P.Q.2d 1857 (Fed. Cir. 2004). More important, the claims in issue are eminently sensical when properly construed using the definitions in the specification.

The Examiner's Answer concludes that giving *concurrently* the meaning of *happening at the same time* cannot be reconciled with the phrase *different times*, which is used in the same clause of the claims. In independent claim 1, for example, the clause in issue reads as follows:

> wherein said triggering schedule includes triggering all said computational nodes C and D at different instances of time essentially concurrently for each decoding iteration.

As we have argued, triggering *essentially concurrently* of all computational nodes is defined in the specification to mean that the nodes are updated *in one step to complete one decoding iteration*, so that the results of updating of some nodes are not used in updating other nodes during the same iteration in order to perform the updating in one step. In contrast to the *essentially concurrently* definition, the specification defines *time instances* (or *instances of time*) using the following sentence: "A soft decision determines the values of the encoded data symbols X_i and Y_i as represented by the branches at time instances corresponding to the state spaces in the trellis." Specification, paragraph [00021]. *Time instances* are therefore defined as "corresponding to the state spaces in the trellis." *Id.* See also the discussion of *time indices* throughout the specification, for example, in paragraphs [00029], [00030], and [00048]. Thus, the phrase *computational nodes C and D at different instances of time* refers to the computational nodes corresponding to the different spaces in the trellis. In accordance with the system of claim 1, all these computational nodes are triggered *essentially concurrently*.

The Examiner's Answer misconstrues the meaning of *essentially concurrently* and *computational nodes at different instances of time*, in derogation of the specification.

3. Meaning of *Partitioning* and *Iteration*

Independent claim 6 includes the following clause:

> partitioning said computational node C at time instances $C_0, C_1, C_2, \ldots, C_N$ into at least two subsets, wherein said triggering schedule includes triggering updates of computational nodes C in a sequence at different time instances in each subset, and wherein said triggering of computational node C at different time

instances in said least two subsets occurs concurrently.

In the Appeal Brief, we argued that Figure 5 and its description not only do not disclose concurrent triggering, but also fail to disclose the step of partitioning. With respect to the *partitioning* limitation, the Examiner's Answer asserts (page 24) that "[i]n Figure 5 for example the first subset could be C_0 and C_1 (first decoder in iteration zero and first decoder in iteration 1), the second subset could be C_1 and C_2 (first decoder in iteration 1 and first decoder in iteration 2), etc.." This construction ignores the meaning of *iteration*. Applicants explicitly defined *iteration* thus: "When all the computational nodes are triggered once, a decoding iteration is defined to take place." Specification, par. [00050]. Regardless of the way C_0, C_1, C_2, …, C_N are partitioned, they are all triggered for every iteration. The index of C (0, 1, 2, . . . N) specifies the state within the trellis, not a particular iteration. *E.g.*, specification, pars. [00021] and [00030]. Therefore, each of the nodes C_0, C_1, and C_2 is triggered in every iteration. Partitioning is not done by iteration.

The Examiner's Answer misconstrues the meanings of *partitioning* and *iteration*.

CONCLUSION

In view of the foregoing, Applicants submit that all pending claims in the application are patentable and request reversal of the rejections.

Respectfully submitted,

Dated **January 8, 2007**

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CLAIMS APPENDIX

The following is a listing of the claims in the application. All claims have been rejected and are involved in this Appeal.

1. (Previously Presented) In a communication system, a method for decoding a sequence of turbo encoded data symbols transmitted over a channel comprising:

updating channel nodes R_x, R_y and R_z based on a received channel output;

initializing outgoing messages from symbol nodes X_i, Y_i and Z_k, wherein said symbol nodes X_i, Y_i and Z_k are in communication with said channel nodes R_x, R_y and R_z; and

triggering updates of computational nodes C and D, associated with different instances of time, in accordance with a triggering schedule, wherein a computational node C_i is in communication with said symbol nodes X_i and Y_i and a computational node D_k is in communication with said symbol nodes X_i and Z_k;

wherein said triggering schedule includes triggering all said computational nodes C and D at different instances of time essentially concurrently for each decoding iteration.

2. (Original) The method as recited in claim 1 wherein said computational node C_i is in communication with state nodes S_i and S_{i-1} associated with a first constituent code, and said computational node D_k is in communication with state nodes σ_k and σ_{k-1} associated with a second constituent code, wherein said first and second constituent codes are associated with a turbo code in said communication system used for encoding said sequence of encoded data symbols.

3. (Original) The method as recited in claim 1 further comprising:

accepting a value of symbol X_i at said symbol node X_i as a decoded value of symbol X_i after at least one iteration of said triggering updates of said computational nodes C and D.

4. (Canceled)

5. (Canceled)

6. (Previously Presented) In a communication system, a method for decoding a sequence of turbo encoded data symbols transmitted over a channel comprising:

updating channel nodes R_x, R_y and R_z based on a received channel output;

initializing outgoing messages from symbol nodes X_i, Y_i and Z_k, wherein said symbol nodes X_i, Y_i and Z_k are in communication with said channel nodes R_x, R_y and R_z;

triggering updates of computational nodes C and D, associated with different instances of time, in accordance with a triggering schedule, wherein a computational node C_i is in communication with said symbol nodes X_i and Y_i and a computational node D_k is in communication with said symbol nodes X_i and Z_k; and

partitioning said computational node C at time instances C_0, C_1, C_2, …, C_N into at least two subsets, wherein said triggering schedule includes triggering updates of computational nodes C in a sequence at different time instances in each subset, and wherein said triggering of computational node C at different time instances in said least two subsets occurs concurrently.

7. (Original) The method as recited in claim 6 further comprising:

determining said sequence at different time instances in each subset for said triggering updates.

8. (Canceled)

9. (Original) The method as recited in claim 6 wherein said least two subsets of computational node C at different time instances C_0, C_1, C_2, …, C_N have at least one common computational node time instance.

10. (Previously Presented) The method as recited in claim 6 further comprising:

partitioning computational node D at different time instances D_0, D_1, D_2, …, D_N into at least two subsets, wherein said triggering schedule includes triggering computational nodes D at different time instances in a sequence in each subset.

11. (Original) The method as recited in claim 10 further comprising:

determining said sequence at different time instances in each subset for said triggering updates.

12. (Original) The method as recited in claim 10 wherein said triggering of computational node D at different time instance in said least two subsets occurs concurrently.

13. (Original) The method as recited in claim 10 wherein said subsets of computational node D at time instances D_0, D_1, D_2, …, D_N have at least one common computational node time instance.

14. (Original) The method as recited in claim 1 wherein said updating includes summing incoming messages to produce an output message, and outputting said output message for updating.

15. (Previously Presented) The method as recited in claim 1 wherein said updating said channel nodes R_x, R_y and R_z based on said received channel output includes:

receiving at said channel node R_x said channel output associated with a symbol X_i;

receiving at said channel node R_y said channel output associated with a symbol Y_i;

receiving at said channel node R_z said channel output associated with a symbol Z_k;

passing from said channel node R_x a likelihood of said symbol X_i, based on said received channel output, to said symbol node X_i;

passing from said channel node R_y a likelihood of said symbol Y_i, based on said received channel output, to said symbol node Y_i; and

passing from said channel node R_z a likelihood of said symbol Z_k, based on said received channel output, to said symbol node Z_k.

16. (Original) The method as recited in claim 1 wherein said initializing outgoing messages from symbol nodes X_i, Y_i and Z_k includes:

passing a message from said symbol node X_i to said computational node C_i of said computational node C, wherein said message is based on a summation of incoming messages at said symbol node X_i;

passing a message from said symbol node X_i to said computational node D_k of said computational node D, wherein said message is based on a summation of incoming messages at said symbol node X_i;

passing a message from said symbol node Y_i to said computational node C_i, wherein said message is based on said likelihood of data symbol Y_i; and

passing a message from said symbol node Z_k to said computational node D_k, wherein said message is based on said likelihood of data symbol Z_k.

17. (Original) The method as recited in claim 1 wherein said sequence of data includes "N" number of symbols, wherein each symbol in said sequence is identified by either a subscript "i" or "k," and wherein said subscript "i" and "k" are references to time instances in the decoding process.

18. (Previously Presented) An apparatus for decoding a sequence of turbo encoded data symbols communicated over a channel comprising:

channel nodes R_x, R_y and R_z for receiving channel output;

symbol nodes X_i, Y_i and Z_k in communication with said channel nodes R_x, R_y and R_z;

state nodes S_i and S_{i-1} associated with a first constituent code in a turbo code;

state nodes σ_k and σ_{k-1} associated with a second constituent code in said turbo code;

a computational node C_i in communication with said symbol nodes X_i and Y_i;

a computational node D_k in communication with said symbol nodes X_i and Z_k, wherein said computational node C_i is in communication with said state nodes S_i and S_{i-1} and said computational node D_k is in communication with said state nodes σ_k and σ_{k-1};

a computational node C_{i+1} in communication with said state node S_i;

a computational node C_{i-1} in communication with said state node S_{i-1};

a computational node D_{K+1} in communication with said state node σ_k; and

a computational node D_{k-1} in communication with said state node σ_{k-1};

wherein computational nodes C and D at different time instances are configured for updates in accordance with an update triggering schedule, said update triggering schedule including concurrent triggering of each node of a first plurality of said computational nodes C, and concurrent triggering of each node of a second plurality of computational nodes D.

19. (Canceled)

20. (Original) The apparatus as recited in claim 18, wherein said update triggering schedule includes triggering updates in a sequence in a partitioned computational nodes C_0, C_1, C_2, …, C_N of at least two subsets and in a sequence in a partitioned computational nodes D_0, D_1, D_2, …, D_N of at least two subsets.

21. (Previously Presented) The apparatus as recited in claim 18 wherein said sequence of turbo encoded data symbols includes "N" number of symbols, wherein each symbol in said

sequence is identified by either a subscript "i" or "k" corresponding to the subscripts used for said state nodes and said computational nodes.

22. (Previously Presented) A processor configured for decoding a sequence of turbo encoded data symbols for communication over a channel comprising:

channel nodes R_x, R_y and R_z for receiving channel output;

symbol nodes X_i, Y_i and Z_k in communication with said channel nodes R_x, Ry and R_z;

state nodes S_i and S_{i-1} associated with a first constituent code in a turbo code;

state nodes σ_k and σ_{k-1} associated with a second constituent code in said turbo code;

a computational node C_i in communication with said symbol nodes X_i and Y_i;

a computational node D_k in communication with said symbol nodes X_i and Z_k, wherein said computational node C_i is in communication with said state nodes S_i and S_{i-1} and said computational node D_k is in communication with said state nodes σ_k and σ_{k-1};

a computational node C_{i+1} in communication with said state node S_i;

a computational node C_{i-1} in communication with said state node S_{i-1};

a computational node D_{K+1} in communication with said state node σ_k; and

a computational node D_{k-1} in communication with said state node σ_{k-1};

wherein computational nodes C and D at different time instances are configured for updates in accordance with an update triggering schedule, said update triggering schedule including concurrent triggering of each node of a first plurality of said computational nodes C, and concurrent triggering of each node of a second plurality of computational nodes D.

23. (Original) The processor as recited in claim 22 wherein said update triggering schedule includes triggering updates of said computational nodes C and D in a sequence of C_0, C_1, C_2, …, C_N, C_{N-1}, C_{N-2}, C_{N-3}, … C_2, C_1, C_0, D_0, D_1, D_2, …, D_N, D_{N-1}, D_{N-2}, D_{N-3}, … D_2, D_1, D_0.

24. (Original) The processor as recited in claim 22 wherein said sequence of data includes "N" number of symbols, wherein each symbol in said sequence is identified by either a subscript "i" or "k" corresponding to the subscripts used for said state nodes and said computational nodes.

25. (Canceled)